Claims

1. Cancelled
2. (New) A method of quickly heating a flowing process fluid comprising:

   a) introducing said process fluid into a heating volume, said heating volume also having an outlet orifice;

   b) transferring sufficient power into said heating volume while said process fluid is flowing through said heating volume to create a heated flowing process fluid wherein the power transferred has a power density greater than 20 $w/cm^3$;

   c) receiving said heated flowing process fluid from the outlet orifice of said heating volume.
3. (New) The method of claim 2 wherein the power transferred has a power density greater than 50w/cm3.
4. (New) The method of claim 2 wherein the power transferred has a power density greater than 100w/cm3.
5. (New) The method of claim 2 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein the ratio of that surface area to the heating volume is at least 2.5 cm-1
6. (New) A method of claim 2 wherein said process fluid is an ozone-solvent solution.
7. (New) The method of claim 1 wherein the heating volume is contained by a non-metallic material.
8. (New) The method of claim 7 wherein the non-metallic material is selected from the group consisting of Teflon PFA, Teflon TFE, Teflon PTFE, PVDF, quartz, glass, plastic, ceramic, Aluminum Oxide, and Aluminum Nitride.
9. (New) The method of claim 2 wherein the heating volume is contained by a non-ferrous metal or a non-ferrous metal alloy.
10. (New) The method of claim 2 wherein the heating volume is contained by a non-ferrous metal or non-ferrous metal alloy selected from the group consisting of aluminum, aluminum alloys, titanium, and titanium alloys.
11. (New) The method of claim 2 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein said power is transferred into said heating volume by resistance heated elements in thermal contact with said surface area.

12. (New) The method of claim 2 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein said power is transferred into said heating volume by induction heated elements in thermal contact with said surface area.

13. (New) The method of claim 2 wherein said heating volume is contained by at least one surface area and wherein said power is transferred into said heating volume by a heated fluid in thermal contact with said surface area.

14. (New) The method of claim 2 wherein said power is transferred from a microwave power source to the flowing process fluid.

15. (New) The method of claim 2 the power is transferred from an infrared power source to the flowing process fluid.

16. (New) The method of claim 2 wherein the power is transferred by mixing a heated fluid with the flowing process fluid.

17. (New) The method of claim 16 wherein the heated fluid comprises steam.

18. (New) The method of claim 2 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein the ratio of that surface area to the heating volume is at least 2.0 cm-1.

19. (New) The method of claim 2 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein the ratio of said surface area to the heating volume is at least 5.0 cm-1.

20. (New) A device for quickly heating a flowing process fluid comprising:

a process fluid heating volume with an inlet for receiving a flowing process fluid and an outlet for delivering said process fluid;

power means for transferring power to said process fluid as said process fluid flows from said inlet, through said process fluid heating volume, to said outlet wherein said power means provides a power density greater than 20 w/cm3 to said flowing process fluid.

21. (New)A device as in claim 20 wherein said power means provides a power density greater than 50 w/cm3 to said flowing process fluid.

22. (New) A device as in claim 20 wherein said power means provides a power density greater than 100 w/cm3 to said flowing process fluid.

23. (New) A device as in claim 20 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein said power means comprises resistance heated elements in thermal contact with said internal surface.

24. (New) A device as in claim 20 wherein said heating volume comprises a heated surface area in thermal contact with the process fluid and wherein said power means comprises induction heated elements in thermal contact with said internal surface

25. (New) A device as in claim 20 wherein said heating volume is contained by at least one surface area, and wherein said power means comprises a heated fluid in thermal contact with said surface area.

26. (New) A device as in claim 20 wherein said power means comprises a microwave power source coupled to a resonant cavity at least partially enclosing the process fluid h(New)eating volume.

27. A device as in claim 20 wherein said power means comprises an infrared power source which illuminates the flowing process fluid as it passes through the process fluid heating volume.

28. (New) A device as in claim 20 wherein said power means comprises a source of heated fluid coupled to an injector directed so as to mix said heated fluid with the flowing process fluid.

29. (New) A device as in claim 28 wherein said heated fluid comprises steam.

30. (New) A device as in claim 20 wherein said heating volume comprises a heated surface area, and wherein the ratio of said surface area to said heating volume is at least 2.0 cm-1.

31. (New) A device as in claim 20 wherein said heating volume comprises a heated surface area, and wherein the ratio of said surface area to said heating volume is at least 5.0 cm-1.

32. (New) A method of quickly heating a flowing process fluid comprising:

a) introducing said process fluid into a heating volume, said heating volume having a heated surface area in thermal contact with said process fluid, said heating volume also having an outlet orifice;

b) transferring sufficient power to said heated surface area while said process fluid is flowing through said heating volume to create a heated flowing process fluid wherein the ratio of said surface area to said heating volume is at least 2.0 cm-1,

c) receiving said heated flowing process fluid from the outlet orifice of said heating volume.

33. (New)A method of claim 32 wherein said process fluid is an ozone-solvent solution.

34. (New) A method of claim 32 wherein the ratio of said surface area to said heating volume is at least 5.0cm-1.

35. (New) A device for quickly heating a flowing process fluid comprising:

a process fluid heating volume with an inlet for receiving a flowing process fluid, a surface area in thermal contact with said process fluid, and an outlet for delivering said process fluid;

power means for transferring power to said process fluid via the transfer of power to said surface area as said process fluid flows from said inlet, through said heating volume, to said outlet wherein the ratio of said surface area to said heating volume is at least 2.0 cm-1.

36. (New) A device of claim 35 wherein said process fluid is an ozone-solvent solution.

37. (New) A device of claim 35 wherein the ratio of said surface area to said heating volume is at least 5.0cm-1.